
Germline competent embryonic stem cells derived from rat blastocysts.

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Public Summary:

Scientific Abstract:

Rats have important advantages over mice as an experimental system for physiological and pharmacological investigations. The lack of rat embryonic stem (ES) cells has restricted the availability of transgenic technologies to create genetic models in this species. Here, we show that rat ES cells can be efficiently derived, propagated, and genetically manipulated in the presence of small molecules that specifically inhibit GSK3, MEK, and FGF receptor tyrosine kinases. These rat ES cells express pluripotency markers and retain the capacity to differentiate into derivatives of all three germ layers. Most importantly, they can produce high rates of chimerism when reintroduced into early stage embryos and can transmit through the germline. Establishment of authentic rat ES cells will make possible sophisticated genetic manipulation to create models for the study of human diseases.

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